

## Assistance of Posyandu Cadres in Implementing Massage and Monitoring Infant Growth and Development through Augmented Reality Application

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### ABSTRACT

Infant health in the early stages of life is greatly influenced by various factors, including proper monitoring of growth and development and providing optimal stimulation. One form of beneficial stimulation is baby massage, which has been proven to help the physical and emotional development of infants. However, the limited knowledge and skills of Posyandu cadres often become an obstacle in providing maximum service. This article examines the implementation of an Augmented Reality (AR)-based application to support Posyandu cadres in guiding infant massage and monitoring infant growth and development at Posyandu. The results of the study indicate that the AR application can improve cadres' knowledge and skills in performing infant massage, as well as help parents understand child growth better. This article also provides recommendations regarding the implementation of the AR application as a technological innovation in Posyandu services.

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## INTRODUCTION

Infancy is a very important phase in human development. During this period, health monitoring and proper stimulation are essential to ensure that babies grow optimally, both physically, cognitively, and emotionally. In Indonesia, Posyandu is one of the public health services that focuses on monitoring infant growth and development. However, one of the main challenges is the limited number of Posyandu cadres in providing adequate education and services, especially related to infant massage and proper monitoring of growth and development.

Along with the development of technology, the emergence of Augmented Reality (AR) in the health sector provides great potential to support education and health services at the local level. One AR-based application that can be used for this purpose is the BERSINAR (Indonesian Healthy Babies with Augmented Reality) application. This application is designed to assist Posyandu cadres and parents in monitoring infant growth and development and provide interactive guidance for infant massage.

The purpose of this study was to analyze the effectiveness of Posyandu cadre assistance in using the AR application to guide infant massage and monitor infant growth and development at Posyandu, as well as to provide recommendations regarding the development of this technology in public health services.

## METHOD

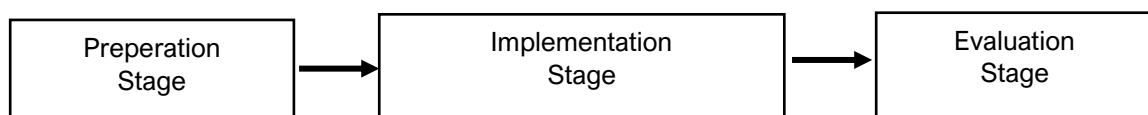


FIGURE 1.

### Community Service Approach

This community service uses a participatory and educational approach with the aim of providing a comprehensive understanding to Posyandu cadres regarding the use of Augmented Reality (AR) technology in the BERSINAR application to support infant health, especially through baby massage and monitoring infant growth and development. This process is carried out through a series of socialization activities, training, mentoring, and evaluation.

### Community Service Stages

#### *Preparation Stage*

- Coordination with Posyandu and Stakeholders

An initial meeting was held with Posyandu administrators and related parties in Wonokusumo Village to explain the objectives, benefits, and implementation plans for this AR application socialization program.

- Development Of Socialization Modules And Materials

The community service team prepared materials in the form of interactive modules and guides, which include:

- o Introduction to the BERSINAR application.
- o Benefits of baby massage for growth and development.
- o How to monitor infant growth and development according to WHO standards.
- o Guide to using the AR application.
- Initial Socialization to Posyandu Cadres  
Holding an introductory session to introduce the BERSINAR application to Posyandu cadres, as well as discussing the hopes and challenges they face in infant health services.

#### Implementation Stage

- Training on the Use of the Augmented Reality Application (BERSINAR)  
This training session is conducted face-to-face with lecture and direct practice methods. Posyandu cadres will be trained in using the BERSINAR application which has an augmented reality feature to guide baby massage and monitor baby growth and development.  
The training materials include:
  - o Operation of the BERSINAR application.
  - o Direct practice using the AR feature to guide baby massage. Techniques used:
  - o Direct demonstration using the AR application via devices such as tablets or smartphones.
- Implementation Assistance at Posyandu  
After the training, Posyandu cadres will be assisted in applying the knowledge and skills they have acquired during the training session. The community service team will monitor the service process at Posyandu, assist cadres in using the application to provide education to parents about baby massage and monitor baby growth and development.  
This assistance is carried out by:
  - o Direct observation at Posyandu during baby monitoring activities.
  - o Periodic consultations
- Socialization to Parents of Babies  
Posyandu cadres will also be trained to conduct socialization and provide education to parents of babies about the importance of massage and monitoring baby growth and development through the AR application. Parents are given simple guidance on how to use this application at home to help their baby's development.

#### Evaluation Stage

- Evaluation of Cadre Knowledge and Skills  
Before and after the training, an evaluation was conducted on Posyandu cadres to measure the increase in their knowledge and skills in performing baby massage and using the AR application to monitor baby growth and development.

Evaluation methods:

- o Pre-test and post-test that measure cadres' understanding of baby massage and growth and development.
- o Observation of cadres' direct practice when using the application.
- Evaluation of Baby Parents' Satisfaction

After the socialization, a survey was conducted on parents of babies who came to Posyandu to measure their understanding of child growth and development and the effectiveness of the AR application used by cadres in providing information.
- Reporting and Recommendations

Based on the evaluation results, the community service team will compile a report and provide recommendations regarding further development of the AR application and improvement of mentoring programs at other Posyandus.

## RESULTS AND DISCUSSION

### Improving Posyandu Cadre Knowledge

Socialization and training using the BERSINAR application based on Augmented Reality (AR) successfully improved Posyandu cadres' understanding of baby massage and monitoring baby growth and development. Before the training, the pre-test results showed that 60% of the cadres had sufficient knowledge, while 40% had insufficient knowledge about baby massage techniques and baby growth and development indicators according to WHO standards.

After the training, the post-test results showed a significant improvement. As many as 85% of the cadres had good knowledge, and 15% had very good knowledge. This shows that the AR technology-based training method can effectively improve Posyandu cadres' understanding in providing baby health services.

### Improving Practical Skills

The use of the BERSINAR application in baby massage practices also improved cadres' practical skills. Before the training, only 50% of cadres were able to perform baby massage with the correct technique. After training and mentoring, the percentage of cadres who were able to practice baby massage correctly increased to 90%.



**FIGURE 2.** Community service activities

One of the superior features of the AR application is the 3D visualization of baby massage steps, which allows cadres to understand and memorize the sequence and massage techniques more easily. This increases cadres' confidence in providing direct services to parents of babies at Posyandu.

### **Utilization of Augmented Reality Technology**

The socialization of the BERSINAR application also highlights the importance of technology in health services at Posyandu. This AR-based application makes it easier for cadres to provide education to parents of babies in a more interactive and interesting way. Observation results show that more than 75% of cadres feel more confident using this application in their interactions with parents of babies.

Cadres also stated that the visualization provided by AR technology helps them explain complex health concepts, such as infant physical growth, fine and gross motor development, and the importance of infant massage for overall infant health. With the help of this application, cadres can explain better and more clearly to parents about their child's development.

### **Discussion**

#### **Effectiveness of Augmented Reality (AR) Technology in Improving Posyandu Cadre Services**

The use of the BERSINAR application based on Augmented Reality has been proven to have a positive impact on improving infant health services at Posyandu. AR technology that offers interactive visual guidance is an effective tool in providing training to cadres and helping them practice baby massage and monitoring infant growth and development. The increase in understanding and skills of Posyandu cadres does not only come from the material presented, but also from the visual approach offered by AR. Three- dimensional visualization and step-by-step instructions are very helpful in reducing errors when performing massage techniques. In addition, this application allows cadres to more easily explain the concept of infant development to parents in an interesting and easy-to- understand way.

#### **Participation of Posyandu Cadres in Using Technology Applications**

Posyandu cadres who previously felt hesitant to use modern technology are now more open to utilizing technology-based applications in their services. This shows that with proper training, cadres can easily adapt and utilize technology to improve the quality of maternal and child health services.

The key factor in the success of this training is the intensive mentoring approach carried out directly in the field. With participatory methods and direct practice, cadres gain real experience in using the application, which accelerates the process of technology adoption. This also proves that a technology-based educational approach can accelerate the transfer of knowledge in the public health sector, especially at the Posyandu cadre level who are usually not exposed to sophisticated technology.

### **Challenges in Implementation**

Although the results of this service are very positive, there are several challenges faced during implementation. One of them is the availability of technological devices, such as tablets or smartphones, at Posyandu. Some cadres have to use personal devices or borrow devices from the baby's parents to run the application. This shows the need for more adequate technological infrastructure support so that

this AR application can be optimally implemented at Posyandu.

In addition, the use of new technology requires time to adjust. Although most cadres can already use the application well, some cadres who are older or less familiar with digital technology need more time to adapt.

## CONCLUSION

The results of this community service show that mentoring Posyandu cadres through the BERSINAR application based on Augmented Reality has succeeded in increasing the knowledge and skills of cadres in practicing baby massage and monitoring baby growth and development. AR technology has proven effective as a tool in providing more interactive and easy-to-understand education, both for Posyandu cadres and parents of babies.

The recommendation from these results is that there needs to be further development related to the provision of more evenly distributed technological infrastructure in Posyandu, as well as further training for cadres who need additional assistance in using new technology.

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